

Amendment After Final
U.S. Patent Application No. 09/475,385



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Reconsideration and continued examination of the present application is respectfully requested.

The amendment to the claims have been essentially made for editorial reasons. In particular, claims 39, 40, 45, and 51 have been converted to independent claims since the Examiner has indicated that these claims contain allowable subject matter. Claim 18 has been deleted. The claims dependent on claim 18 have been amended to be dependent on claim 40. Furthermore, applicants believe that in view of the above amendments, all of the pending claims are in condition for allowance or at the very least, in a better condition for appeal. Furthermore, the amendment in the opinion of the applicants, does not necessitate any further searching by the Examiner or raises any new issues of patentability since claims having a similar scope have already been considered by the Examiner. Accordingly, since no questions of new matter should arise, entry of this amendment is respectfully requested.

The applicants acknowledge and appreciate the Examiner's withdrawal of the finality of the previous Office Action.

At page 2 of the Office Action, the Examiner rejects claims 18, 22, 23, 24, 38, 46-48, and 50 under 35 U.S.C. §102(b) as being anticipated by Sutt, Jr. The Examiner asserts that Sutt, Jr. shows a carbon molecular sieve for selectively adsorbing gases or liquids which uses an activated carbon or molecular sieve carbon substrate having a polymer impregnated on its surface by a coating process. For the following reasons, this rejection is respectfully traversed.

Since claim 18 is cancelled, this rejection is moot. The remaining rejected claims are dependent on a claim indicated as allowable by the Examiner.

Accordingly, the rejection should be withdrawn.

The Examiner then rejects claim 25 under 35 U.S.C. §103(a) as being unpatentable over Sutt, Jr. in view of Golden et al. (U.S. Patent No. 5,135,548). The Examiner asserts that Sutt, Jr. discloses all the limitations of claim 25 except that water is used as the adsorbent. The Examiner, in order to overcome this deficiency, relies on Golden et al. and asserts that this patent shows a carbon molecular sieve having a surface that is modified by impregnation to make it hydrophilic for absorbing water. Accordingly, the Examiner concludes it would have been obvious to one having ordinary skill in the art to use a hydrophilic modified carbon material to absorb water in order to provide an adsorbent. For the following reasons, this rejection is respectfully traversed.

Claim 25 is now dependent on allowable claim 40 and therefore, this claim is also patentable. Accordingly, the rejection should be withdrawn.

The Examiner then rejects claim 19 under 35 U.S.C. §103(a) as being unpatentable over Sutt, Jr. in view of Golden et al. (U.S. Patent No. 5,447,557). The Examiner again relies on Sutt, Jr. for the same arguments set forth above with respect to claim 18. The Examiner further asserts that Golden et al. shows a modified carbonaceous adsorbent that can be a molecular sieve, activated carbon, carbon black, and coal. Therefore, the Examiner asserts it would have been obvious to one having ordinary skill in the art to realize the functional equivalency of carbon black and carbon molecular sieve for the absorption of an adsorbate into the pores and to use one of the other carbon supports of Golden et al. For the following reasons, this rejection is respectfully traversed.

Claim 19 is now dependent on allowable claim 40. Accordingly, the rejection should be withdrawn.

At page 4 of the Office Action, the Examiner indicates the allowable subject matter. As

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indicated above, the applicants have made claims 39, 40, 45, and 51 independent and as a result, all pending claims should be allowed for this reason and the reasons previously provided to the Examiner in earlier responses.

CONCLUSION

In view of the foregoing remarks, the Applicants respectfully request the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

19. (Twice Amended) The method of claim [18]40, wherein said [modified] carbonaceous material is carbon black.

20. (Amended) The method of claim [18]40, wherein said organic group is $(C_6H_4)-SO_3^- Na^+$, $(C_6H_4)-SO_3^- Li^+$, or $(C_6H_4)SO_3^- K^+$.

21. (Amended) The method of claim [18]40, wherein said organic group is $p-C_6H_4SO_2NH_2$ or $-C_6H_4NH_2$.

22. (Amended) The method of claim [18]40, wherein said organic group is hydrophilic.

23. (Amended) The method of claim [18]40, wherein said adsorbate is polar.

24. (Amended) The method of claim [18]40, wherein said adsorbate is water, ammonia, carbon dioxide, hydrogen sulfide, argon, oxygen, or methane.

39. (Amended) A method to adsorb an adsorbate comprising contacting said adsorbate with a modified carbonaceous material capable of adsorbing said adsorbate wherein said modified carbonaceous material comprises at least one organic group attached to a carbonaceous material, wherein said organic group comprises an aromatic group or a C_1-C_{12} alkyl group directly attached to the carbonaceous material, with the proviso that said carbonaceous material is not activated carbon, wherein said organic group is substituted with the functional group having the formula R, OR, COR, COOR, OCOR, a carboxylate salt, halogen, CN, NR_2 , SO_3H , a sulfonate salt, OSO_3H , a OSO_3^- salt, $NR(COR)$, $CONR_2$, NO_2 , PO_3H_2 , a phosphonate salt, a phosphate salt, $N=NR$, $NR_3^+X^-$, $PR_3^+X^-$, S_kR , SSO_3H , a SSO_3^- salt, SO_2NRR' , SO_2SR , $SNRR'$, SNQ , SO_2NQ , CO_2NQ , $S-(1,4-piperazinediyl)-SR$, $2-(1,3-dithianyl)$ $2-(1,3-dithiolanyl)$, SOR , or SO_2R , wherein R and

R', which are the same or different, are independently hydrogen, branched or unbranched C₁-C₂₀ substituted or unsubstituted, saturated or unsaturated hydrocarbon, k is an integer ranging from 1-8, anion X⁻ is a halide or an anion derived from a mineral or organic acid, Q is (CH₂)_w, (CH₂)_xO(CH₂)_z, (CH₂)_xNR(CH₂)_z, or (CH₂)_xS(CH₂)_z, where w is an integer from 2 to 6 and x and z are integers from 1 to 6, [The method of claim 38,] wherein said hydrocarbon is alkyl, alkenyl, alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, substituted or unsubstituted alkylaryl, or substituted or unsubstituted arylalkyl.

40. (Amended) A method to adsorb an adsorbate comprising contacting said adsorbate with a modified carbonaceous material capable of adsorbing said adsorbate wherein said modified carbonaceous material comprises at least one organic group attached to a carbonaceous material, wherein said organic group comprises an aromatic group or a C₁-C₁₂ alkyl group directly attached to the carbonaceous material, with the proviso that said carbonaceous material is not activated carbon, [The method of claim 18,] wherein said organic group is an aromatic group of the formula A_yAr- wherein Ar is an aromatic radical and A is a substituent on the aromatic radical, and y is an integer from 1 to the total number of -CH radicals in the aromatic radical.

45. (Amended) A method to adsorb an adsorbate comprising contacting said adsorbate with a modified carbonaceous material capable of adsorbing said adsorbate wherein said modified carbonaceous material comprises at least one organic group attached to a carbonaceous material, wherein said organic group comprises an aromatic group or a C₁-C₁₂ alkyl group directly attached to the carbonaceous material, with the proviso that said carbonaceous material is not activated carbon, [The method of claim 18,] wherein said organic group is a C₁-C₁₂ alkyl group having at least one acidic group having a pKa of less than 11 or at

least one salt of an acidic group having a pKa of less than 11, or a mixture thereof.

46. (Amended) The method of claim [18]40, wherein there is more than one type of organic group attached to said carbonaceous material.

47. (Amended) The method of claim [18]40, wherein some of the carbonaceous material has been modified with one organic group and another portion of the carbonaceous material has been modified with a different organic group.

48. (Amended) The method of claim [38]39, wherein there is more than one type of organic group attached to said carbonaceous material.

50. (Amended) The method of claim [18]40, wherein said carbonaceous material is material obtained by the compaction of small carbon particles.

51. (Amended) A method to adsorb an adsorbate comprising contacting said adsorbate with a modified carbonaceous material capable of adsorbing said adsorbate wherein said modified carbonaceous material comprises at least one organic group attached to a carbonaceous material, wherein said organic group comprises an aromatic group or a C₁-C₁₂ alkyl group directly attached to the carbonaceous material, with the proviso that said carbonaceous material is not activated carbon, [The method of claim 18,] wherein said carbonaceous material is obtained by the pyrolysis of fuel oil or polymeric precursors.